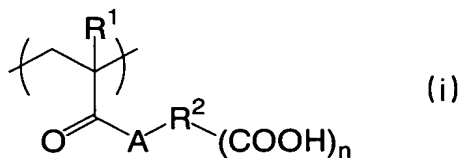


WHAT IS CLAIMED IS:

1. A planographic printing plate precursor comprising:  
on a substrate, a photosensitive layer containing an infrared absorbing agent, a sulfonium salt polymerization initiator, a polymerizable compound and a binder polymer,  
wherein the central line average surface roughness (Ra) of the surface of the substrate on which the photosensitive layer is arranged is in the range of 0.35 to 0.55  $\mu\text{m}$ .
2. A planographic printing plate precursor according to claim 1, wherein the substrate is an aluminum substrate.
3. A planographic printing plate precursor according to claim 2, wherein the surface of the aluminum substrate is subjected to at least one surface treatment selected from the group consisting of mechanical surface roughening, chemical etching, electrolytic grinding treatment, and electrochemical surface roughening.
4. A planographic printing plate precursor according to claim 1, wherein the binder polymer has a repeating unit represented by the following general formula (i):



wherein in general formula (i),  $R^1$  represents a hydrogen atom or a methyl group;  $R^2$  represents a linking group composed of two or more atoms selected from the group consisting of a carbon atom, a hydrogen atom, an oxygen atom, a nitrogen atom and a sulfur atom, wherein the total number of atoms in  $R^2$  is 2 to 82; A represents an oxygen atom or  $-NR^3-$  wherein  $R^3$  represents a hydrogen atom or a monovalent hydrocarbon group having 1 to 10 carbon atoms; and n is an integer of 1 to 5.

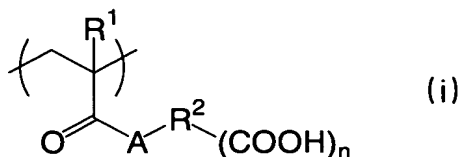
5. A planographic printing plate precursor according to claim 4, wherein the substrate is an aluminum substrate.

6. A planographic printing plate precursor according to claim 5, wherein the surface of the aluminum substrate is subjected to at least one surface treatment selected from the group consisting of mechanical surface roughening, chemical etching, electrolytic grinding treatment, and electrochemical surface roughening.

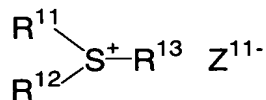
7. A planographic printing plate precursor comprising:  
on a substrate, a photosensitive layer containing an infrared absorbing agent, a sulfonium salt polymerization initiator, a polymerizable compound, and a binder polymer having a repeating unit represented by the following general formula (i), wherein the sulfonium salt polymerization initiator is a sulfonium salt represented by the following general formula (I), and the central line average surface roughness ( $R_a$ ) of the surface of the substrate on which the

photosensitive layer is arranged is in the range of 0.35 to 0.55  $\mu\text{m}$ ,

General formula (i)



wherein in general formula (i),  $\text{R}^1$  represents a hydrogen atom or a methyl group;  $\text{R}^2$  represents a linking group composed of two or more atoms selected from the group consisting of a carbon atom, a hydrogen atom, an oxygen atom, a nitrogen atom and a sulfur atom, wherein the total number of atoms in  $\text{R}^2$  is 2 to 82; A represents an oxygen atom or  $\text{---NR}^3\text{---}$ , wherein  $\text{R}^3$  represents a hydrogen atom or a monovalent hydrocarbon group having 1 to 10 carbon atoms; and n is an integer of 1 to 5;  
General formula (I)



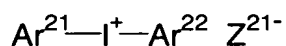
wherein in general formula (I),  $\text{R}^{11}$ ,  $\text{R}^{12}$  and  $\text{R}^{13}$  may each be the same or different, and each represents a hydrocarbon group having 20 or less carbon atoms which may have at least one substituent group selected from the group consisting of a

halogen atom, a nitro group, an alkyl group having 12 or less carbon atoms, an alkoxy group having 12 or less carbon atoms and an aryloxy group having 12 or less carbon atoms; and  $Z^{11-}$  represents a counterion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, a hexafluorophosphate ion, a carboxylate ion, and a sulfonate ion.

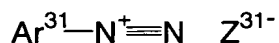
8. A planographic printing plate precursor according to claim 7, wherein the substrate is an aluminum substrate.

9. A planographic printing plate precursor according to claim 8, wherein the surface of the aluminum substrate is subjected to at least one surface treatment selected from the group consisting of mechanical surface roughening, chemical etching, electrolytic grinding treatment, and electrochemical surface roughening.

10. A planographic printing plate precursor according to claim 7, wherein the photosensitive layer further comprises at least one of iodonium salt represented by the following general formula (II) and diazonium salt represented by the following general formula (III) in addition to the sulfonium salt polymerization initiator;  
General formula (II)



wherein in general formula (II),  $\text{Ar}^{21}$  and  $\text{Ar}^{22}$  each independently represents an aryl group having 20 or less carbon atoms which may have a substituent group selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 12 or less carbon atoms, an alkoxy group having 12 or less carbon atoms and an aryloxy group having 12 or less carbon atoms; and  $\text{Z}^{21-}$  represents a counterion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, a hexafluorophosphate ion, a carboxylate ion, and a sulfonate ion;  
General formula (III)



wherein in general formula (III),  $\text{Ar}^{31}$  represents an aryl group having 20 or less carbon atoms which may have a substituent group selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 12 or less carbon atoms, an alkoxy group having 12 or less carbon atoms, an aryloxy group having 12 or less carbon atoms, an alkylamino group having 12 or less carbon atoms, a dialkylamino group having 12 or less carbon atoms, an arylamino group having 12 or less carbon atoms and a diarylamino group having 12 or less carbon atoms; and  $\text{Z}^{31-}$  represents a counterion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, a

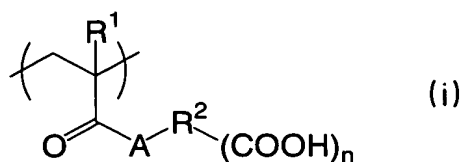
hexafluorophosphate ion, a carboxylate ion and a sulfonate ion.

11. A planographic printing plate precursor according to claim 10, wherein the substrate is an aluminum substrate.

12. A planographic printing plate precursor according to claim 11, wherein the surface of the aluminum substrate is subjected to at least one surface treatment selected from the group consisting of mechanical surface roughening, chemical etching, electrolytic grinding treatment, and electrochemical surface roughening.

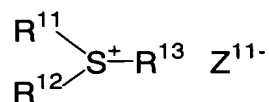
13. A planographic printing plate precursor comprising:  
on a substrate, a photosensitive layer containing an infrared absorbing agent, a sulfonium salt polymerization initiator, a polymerizable compound, and a binder polymer, wherein the binder polymer has a repeating unit represented by the following general formula (i), the polymerizable compound is an addition-polymerizable compound having at least one ethylenically unsaturated double bond, the sulfonium salt polymerization initiator is a sulfonium salt represented by the following general formula (I), and the central line average surface roughness (Ra) of the surface of the substrate on which the photosensitive layer is arranged is in the range of 0.35 to 0.55  $\mu\text{m}$ ,

General formula (i)



wherein in general formula (i),  $\text{R}^1$  represents a hydrogen atom or a methyl group;  $\text{R}^2$  represents a linking group composed of two or more atoms selected from the group consisting of a carbon atom, a hydrogen atom, an oxygen atom, a nitrogen atom and a sulfur atom, wherein the total number of atoms in  $\text{R}^2$  is 2 to 82; A represents an oxygen atom or  $-\text{NR}^3-$  where  $\text{R}^3$  represents a hydrogen atom or a monovalent hydrocarbon group having 1 to 10 carbon atoms; and n is an integer of 1 to 5;

General formula (I)



wherein in general formula (I),  $\text{R}^{11}$ ,  $\text{R}^{12}$  and  $\text{R}^{13}$  may each be the same or different and each represents a hydrocarbon group having 20 or less carbon atoms which may have at least one substituent group selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 12 or less carbon atoms, an alkoxy group having 12 or less carbon atoms and an aryloxy group having 12 or less carbon atoms; and  $\text{Z}^{11-}$  represents a counterion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, a

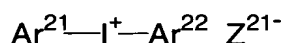
hexafluorophosphate ion, a carboxylate ion, and a sulfonate ion.

14. A planographic printing plate precursor according to claim 13, wherein the substrate is an aluminum substrate.

15. A planographic printing plate precursor according to claim 14, wherein the surface of the aluminum substrate is subjected to at least one surface treatment selected from the group consisting of mechanical surface roughening, chemical etching, electrolytic grinding treatment, and electrochemical surface roughening.

16. A planographic printing plate precursor according to claim 13, wherein the photosensitive layer further comprises at least one of the iodonium salt represented by the following general formula (II) and the diazonium salt represented by the following general formula (III) in addition to the sulfonium salt polymerization initiator,

General formula (II)

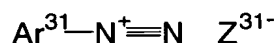


wherein in general formula (II),  $\text{Ar}^{21}$  and  $\text{Ar}^{22}$  each independently represents an aryl group having 20 or less carbon atoms which may have a substituent group selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 12 or less carbon atoms, an alkoxy group having 12 or



less carbon atoms and an aryloxy group having 12 or less carbon atoms; and  $Z^{21-}$  represents a counterion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, a hexafluorophosphate ion, a carboxylate ion, and a sulfonate ion;

General formula (III)



wherein in general formula (III),  $Ar^{31}$  represents an aryl group having 20 or less carbon atoms which may have a substituent group selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 12 or less carbon atoms, an alkoxy group having 12 or less carbon atoms, an aryloxy group having 12 or less carbon atoms, an alkylamino group having 12 or less carbon atoms, a dialkylamino group having 12 or less carbon atoms, an arylamino group having 12 or less carbon atoms and a diarylamino group having 12 or less carbon atoms; and  $Z^{31-}$  represents a counterion selected from the group consisting of a halogen ion, a perchlorate ion, a tetrafluoroborate ion, a hexafluorophosphate ion, a carboxylate ion, and a sulfonate ion.

17. A planographic printing plate precursor according to claim 16, wherein the substrate is an aluminum substrate.

18. A planographic printing plate precursor according to

claim 17, wherein the surface of the aluminum substrate is subjected to at least one surface treatment selected from the group consisting of mechanical surface roughening, chemical etching, electrolytic grinding treatment, and electrochemical surface roughening.